

Mono-isononyl phthalate

Metabolite of di-isononyl phthalate (CAS No. 28553-12-0)

Di-isononyl phthalate is actually a mixture of phthalates with alkyl side chains of varying length (C8, C9, and C10). Di-isononyl phthalate is primarily used to produce flexible plastics and has been used to replace di-2-ethylhexyl phthalate in some plastics. Di-isononyl phthalate is now widely used in such products as children's toys, flooring, gloves, food-packaging material, drinking straws, and garden hoses. People exposed to di-isononyl phthalate will excrete mono-isononyl phthalate in their urine. The amount of mono-isononyl phthalate is an indicator of how much contact with di-isononyl

phthalate has occurred.

Workplace air standards for external exposure have not been established for di-isononyl phthalate. Generally, di-isononyl phthalate has low acute toxicity in animals. Although considered an animal carcinogen, di-isononyl phthalate has not been completely classified as to human carcinogenicity (U.S. EPA, IARC, NTP).

Concentrations documented in this *Report* are close to the detection limit. In a previous study of a non-random subsample from NHANES III, Blount et al. (2000) also demonstrated a low detection rate (0.8 µg/L detection limit) and 95th percentile levels similar to this *Report*.

Table 74. Mono-isononyl phthalate

Geometric mean and selected percentiles of urine concentrations (in µg/L) for the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999-2000.

	Geometric mean (95% conf. interval)	Selected percentiles (95% confidence interval)						Sample size
		10th	25th	50th	75th	90th	95th	
Total, age 6 and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	3.50 (<LOD-11.9)	2541
Age group								
6-11 years	*	< LOD	< LOD	< LOD	< LOD	< LOD	5.70 (<LOD-22.5)	328
12-19 years	*	< LOD	< LOD	< LOD	< LOD	< LOD	2.30 (<LOD-9.60)	752
20 years and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	3.10 (<LOD-11.9)	1461
Gender								
Males	*	< LOD	< LOD	< LOD	< LOD	< LOD	4.90 (1.20-15.6)	1215
Females	*	< LOD	< LOD	< LOD	< LOD	< LOD	2.50 (<LOD-6.80)	1326
Race/ethnicity								
Mexican Americans	*	< LOD	< LOD	< LOD	< LOD	< LOD	1.40 (<LOD-2.70)	814
Non-Hispanic blacks	*	< LOD	< LOD	< LOD	< LOD	< LOD	6.80 (<LOD-15.6)	603
Non-Hispanic whites	*	< LOD	< LOD	< LOD	< LOD	< LOD	3.50 (<LOD-15.7)	911

< LOD means less than the limit of detection, which is 0.8 µg/L.

* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.

Table 75. Mono-isononyl phthalate (creatinine adjusted)

Geometric mean and selected percentiles of urine concentrations (in µg/gram of creatinine) for the U.S. population aged 6 years and older, National Health and Nutrition Examination Survey, 1999-2000.

	Geometric mean (95% conf. interval)	Selected percentiles (95% confidence interval)						Sample size
		10th	25th	50th	75th	90th	95th	
Total, age 6 and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	4.29 (3.16-6.76)	2541
Age group								
6-11 years	*	< LOD	< LOD	< LOD	< LOD	< LOD	6.00 (2.84-14.2)	328
12-19 years	*	< LOD	< LOD	< LOD	< LOD	< LOD	1.94 (1.36-6.32)	752
20 years and older	*	< LOD	< LOD	< LOD	< LOD	< LOD	4.62 (3.33-7.79)	1461
Gender								
Males	*	< LOD	< LOD	< LOD	< LOD	< LOD	4.24 (2.22-8.91)	1215
Females	*	< LOD	< LOD	< LOD	< LOD	< LOD	4.29 (3.33-5.47)	1326
Race/ethnicity								
Mexican Americans	*	< LOD	< LOD	< LOD	< LOD	< LOD	3.51 (2.86-4.94)	814
Non-Hispanic blacks	*	< LOD	< LOD	< LOD	< LOD	< LOD	4.26 (1.88-8.57)	603
Non-Hispanic whites	*	< LOD	< LOD	< LOD	< LOD	< LOD	5.00 (3.23-9.07)	911

< LOD means less than the limit of detection (see previous table).

* Not calculated. Proportion of results below limit of detection was too high to provide a valid result.